

REMARKS

This responds to the Final Office Action mailed on September 6, 2006. Claims 1, 5, 31, and 33 show proposed amendments to the claims, no claims are canceled, and no claims are added; as a result, claims 1-12 and 28-39 remain pending in this application.

§112 Rejection of the Claims

Claims 5, 28, 31, and 36 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant has added language to claims 5 and 31 to further clarify the claims, however the scope of the claims is intended to be the same after the amendment as it was before the amendment. No new matter is added.

Regarding claims 28 and 36, Applicant respectfully traverses the rejection, and submits that claims 28 and 36 are definite under the requirements of 35 USC § 112, second paragraph. The rejection stated that “cooling and heat are two entirely separate concepts of thermal energy.”

Base claim 8 recites “a cooling system to extract heat from the crucible.” Claim 28 further refines claim 9 (and base claim 8), by reciting conducting heat from a bottom of the crucible. Thermodynamically, Applicant submits that by definition, cooling an object such as a crucible involves extracting or otherwise conducting heat away from the hot object. As such, Applicant submits that cooling is not entirely separate from heat, as a cooling operation involves the removal of heat. The undersigned invites the Examiner to call and discuss proposed language regarding cooling if the above explanation is not sufficient. Reconsideration and withdrawal of the 35 USC § 112, second paragraph rejections are respectfully requested.

§102 Rejection of the Claims

Claims 1-2 and 4-5 were rejected under 35 USC § 102(b) as being anticipated by Pinkhasov (U.S. 4,565,711). Applicant respectfully traverses the rejection for at least the following reasons.

The rejection states that “Pinkhasov 711 shows the container being integrally formed and including multiple components, i.e. it is a full container with a bottom and two side walls which

would read on integrally formed and having multiple components as it is situated on turntable (11) as it is interacted with components 13 (vapor generator) and the counterelectrode (21).”

Pinkhasov appears to show a single component quartz crucible 10 with walls and a bottom formed in a single unit. Pinkhasov does not show a crucible wherein the base container includes multiple separable components. At least one advantage of multiple separable components includes ease of ingot removal as discussed in the specification in general, and specifically on page 8, lines 18-27.

In contrast, claim 1 recites a *crucible* (not other system components) wherein the base container includes multiple separable components.

Because Pinkhasov does not show every element of Applicant’s independent claims, a 35 USC §102(b) rejection is not supported. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claim 1. Additionally, reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 2 and 4-5 at least as depending on an allowable base claim.

§103 Rejection of the Claims

Claim 3 was rejected under 35 USC § 103(a) as being unpatentable over Pinkhasov (U.S. 4,565,711) in view of Yamagishi (U.S. 5,788,718). Claims 6-7 were rejected under 35 USC § 103(a) as being unpatentable over Pinkhasov (U.S. 4,565,711) in view of Junkichi (JP 60141696 A). Applicant respectfully submits that the additional references of Yamagishi and Junkichi fail to cure the rejection based on Pinkhasov for at least the reasons outlined above.

Because the cited references, either alone or in combination, do not show every element of Applicant’s independent claims, a 35 USC §103(a) rejection is not supported by the references. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 3 and 6-7.

Claims 8-10, 12, and 28 were rejected under 35 USC § 103(a) as being unpatentable over Wilson (U.S. 3,503,717) in view of Pinkhasov (U.S. 4,565,711) in view of Junkichi (JP 60141696 A). Claim 11 was rejected under 35 USC § 103(a) as being unpatentable over Wilson (U.S. 3,503,717) in view of Pinkhasov (U.S. 4,565,711) in further view of Junkichi (JP

60141696 A) in further view of Yamagishi (U.S. 5,788,718). Claims 29 and 31-34 were rejected under 35 USC § 103(a) as being unpatentable over Pinkhasov (U.S. 4,565,711) in view of Junkichi (JP 60141696 A). Claim 30 was rejected under 35 USC § 103(a) as being unpatentable over Pinkhasov (U.S. 4,565,711) in view of Yamagishi (U.S. 5,788,718). Applicant respectfully traverses the rejection for at least the following reasons.

The rejection states that Pinkhasov teaches that “both silicon and boron nitrides were viewed as coating equivalents in the art.” The rejection further states that Junkichi “teaches a quartz container for example a crucible that has a silicon nitride layer coating and then on top a boron nitride layer unlike how applicant has claimed the crucible with a boron nitride followed by the silicon nitride layer.” Applicant agrees with the Examiner that Junkichi does not show a boron nitride layer followed by a silicon nitride layer.

Junkichi recites that boron nitride has “good adhesiveness to a quartz container *due to* (emphasis added) the interposition of a Si₃N₄ layer.” In order to achieve Junkichi’s goal of improving adhesion, Applicant submits that Junkichi teaches away from any other order of coating layers. This interpretation is also found in the title of Junkichi (“Single crystal growth container, e.g. for III-V cpds. – is obts. by *forming silicon nitride then boron nitride layer* (emphasis added) on quartz container”).

Pinkhasov appears to show only a single layer coating on a crucible. Applicant notes that silicon nitride and boron nitride are both recited in Pinkhasov, however Applicant is unable to find in Pinkhasov any teaching of interchangeability or comparison between any single layer coating options.

Applicant respectfully submits that 1) Pinkhasov does not teach interchangeability, and 2) combination of the references as suggested in the rejection is improper because Junkichi teaches away from changing an order of coating layers. The specification in general, and at least page 6, lines 14-29 discuss advantages of coating layers as recited in the claims.

The present Office Action maintains that interchanging coating layers is obvious, however Applicant reiterates that there is no teaching to exchange order of layers, and in fact Junkichi teaches away from exchanging coating layer order. Applicant respectfully submits that the mere naming of two layers in combined references is not enough to suggest an exchanging of layer order that affects which layer is in contact with an ingot. As discussed in Applicant’s

specification in general, and at least on page 6, line 30 through page 7, line 9 chemical interactions are important, and which layer is in contact with the ingot must be specifically taught.

In contrast, to Pinkhasov, Junkichi, and other references listed in the present rejections, independent claims 8 and 29 include a coating layer covering at least a portion of the base container, wherein the coating layer includes a first layer of boron nitride adjacent to the base container and a second layer of silicon nitride over the layer of boron nitride.

Applicant respectfully submits that at least Pinkhasov and Junkichi are not combinable as discussed above. Even if the references were combined, because the cited references do not show every element of Applicant's independent claims, a 35 USC §103(a) rejection is not supported by the references. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 8-12 and 28-34.

Claims 35-36 and 38 were rejected under 35 USC § 103(a) as being unpatentable over Wilson (U.S. 3,503,717) in view of Pinkhasov (U.S. 4,565,711). Claim 37 was rejected under 35 USC § 103(a) as being unpatentable over Wilson (U.S. 3,503,717) in view of Pinkhasov (U.S. 4,565,711) in further view of Yamagishi (U.S. 5,788,718). Claim 39 was rejected under 35 USC § 103(a) as being unpatentable over Wilson (U.S. 3,503,717) in view of Pinkhasov (U.S. 4,565,711) in further view of Junkichi (JP 60141696 A).

The rejection regarding claim 35 states that Wilson shows cooling tubes 28 "which would read on directional solidification cooling system." Applicant maintains traversal of this characterization of Wilson. While Wilson does appear to show cooling tubes, Applicant is unable to find any teaching in Wilson that indicates directional solidification.

The responses to Applicant's previous arguments state that, "the prior art teaches a cooling system that is capable and operable of acting in coordination of a direction." Applicant is unable to find support for this contention in the Wilson reference. It appears that the Examiner is taking official notice of "coordination in a direction." Applicant respectfully objects and, pursuant to M.P.E.P. § 2144.03, Applicant respectfully requests that the Examiner cite references in support of this position.

In contrast to Wilson or other combinations of references in the present rejection, claim 35 includes a cooling system to extract heat from the crucible including a directional solidification cooling system. The specification in general, and at least page 9, lines 22-29 discuss methods and advantages of directional solidification.

Because the cited references, either alone or in combination, do not show every element of Applicant's independent claims, a 35 USC §103(a) rejection is not supported by the references. Reconsideration and withdrawal of the rejection are respectfully requested with respect to claims 35-39.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6944 to facilitate prosecution of this application.


If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

MOHAN CHANDRA ET AL.

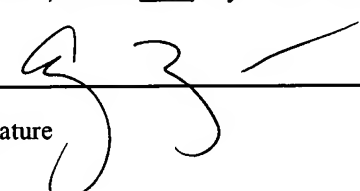
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 6th day of November, 2006.

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Signature